

ENHANCING COLLEGE MATHEMATICS AND STATISTICS TEACHING WITH DESMOS CLASSROOM

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Desmos Classroom is an exceptional online platform designed to enhance mathematical and statistical learning in various educational settings. The platform is equipped with interactive features that enable teachers to create customized lessons and assignments that are highly engaging and challenging for their students. With its user-friendly and visually appealing interface, it is an ideal tool for students of all ages and abilities. Students can access the platform from anywhere and work through the activities at their own pace while receiving immediate feedback on their work. This feedback can help improve their problem-solving skills significantly. Moreover, teachers can monitor their students' progress in real-time, identify areas where students may be struggling and provide additional support as required. This paper aims to demonstrate that Desmos Classroom is an incredibly valuable platform that can help educators create more dynamic and compelling learning experiences for their students with the utmost confidence. Click [here](#) to access the demo presentation created for the conference and this paper. Copy and edit the activity to see the teacher's view.

Interactive Notes for Active Learning. Desmos Classroom is the ultimate solution to active learning and instant feedback. It offers interactive notes that demand students' continuous attention and promote student engagement. The platform includes unique features that make learning more fun and challenging. One of these features, demonstrated on page 3 of the demo presentation, involves giving students two questions based on the lecture notes on the side. Desmos checks their answers immediately, and if both answers are correct, more hidden content is revealed. This fosters student engagement and encourages them to read the notes attentively and strive for accuracy. Teachers can use this feature to create engaging lecture notes that reinforce student understanding of key concepts. With Desmos Classroom, traditional lecture notes are transformed into a dynamic learning experience that stimulates student engagement and participation.

Easy to Build and Edit. Desmos Classroom simplifies the process of building and editing activities by providing a user-friendly interface that allows teachers to effortlessly create interactive learning experiences. With its drag-and-drop functionality (see page 4 of the demo presentation), teachers can easily construct activities by selecting and placing components such as text notes, multiple-choice questions, math answer boxes, sketch pads, and action buttons. These existing activity components offer a wide range of options to suit various learning objectives. Furthermore, Desmos Classroom allows teachers to customize the layout of activities by choosing between one column and two columns, and freely

reordering the positions of each component on the page. This flexibility empowers teachers to design activities that best align with their instructional goals and engage students in meaningful ways. The intuitive and adaptable nature of Desmos Classroom's activity builder makes it an efficient and convenient tool for educators to create interactive and dynamic learning materials.

Sharing and Viewing Students' Work. Desmos Classroom offers a diverse range of options for students to share their work, including typed answers, sketches, multiple-choice responses, pictures, and even audio recordings. This multifaceted approach to sharing complements traditional in-class verbal responses, providing a more comprehensive view of student understanding. Teachers have the ability to view students' work in real-time, capturing snapshots for further in-depth discussions, and providing feedback directly on the screen. This real-time feedback feature fosters more in-depth classroom discussions and promotes student engagement. Moreover, Desmos Classroom facilitates the process of checking student participation in online classes. As an example, in the demo presentation, on page 5, students are challenged to achieve the highest score by providing a linear inequality. In the teacher's view, teachers can view all students' typed linear inequality and their graphs in real-time. The feedback provided not only indicates whether a student has the highest score in the class, but also encourages students to persevere and strive for a higher score. The "explain your thinking" component allows students who have solved the puzzle to share their strategies and reasoning with their classmates, fostering a collaborative, interactive, and supportive learning environment.

Real Data Analysis. Desmos Classroom streamlines the process of accessing real data sources for statistical classroom learning, including datasets gathered in class through the use of Desmos or Google Forms. This integration of real-time datasets empowers students to collect and analyze data on the fly, presenting valuable opportunities for conducting experiments, simulations, and investigations in the classroom. A noteworthy example is found on pages 6 and 7 of the demo presentation, where students engage in a simulation involving their own personalized spinners, landing on either red or blue. This hands-on activity allows students to directly observe and comprehend the connection between theoretical and empirical probabilities. Furthermore, the ability for students to create their own spinners adds an element of infinite "replayability," enhancing the teaching of probability using a spinner and fostering ongoing exploration and understanding.

Promoting Student-based Definitions and Explanations. Desmos Classroom actively fosters the development of student-based definitions and explanations, which is particularly beneficial for students grappling with formal definitions and concepts. By presenting alternative perspectives, Desmos Classroom enhances student comprehension and retention. An illustrative example can be found on page 8 of the demo presentation, where an open-ended question challenges students: "Mike claims he can create a spinner where red and blue are both unlikely. Mia says that's not possible. Who do you think is correct?" The answer hinges on the construction of the spinner, allowing for the possibility of either Mike or Mia being correct depending on the student's appropriate setup. This exercise not only equips students with the skills to apply their knowledge in quantitative

reasoning but also imparts the notion that not all math questions have a singular definitive answer. By facilitating classroom-wide discussions to analyze various reasonings provided by students, Desmos Classroom cultivates an environment where students learn the value of diverse perspectives and critical thinking.

Ready-to-use Activities and Resources. Desmos Classroom not only empowers teachers to create their own activities but also offers a wealth of pre-existing resources developed by other educators that are readily available and easily customizable. This feature saves valuable time for instructors while ensuring that students have access to high-quality and relevant materials. For instance, on page 9 of the demo presentation, teachers can explore a range of options such as Skew the Script, the Desmos Featured Collection, searching activities online, or even integrate resources from Mathigon. These curated resources provide a rich repository of algebra and statistics activities that have been thoughtfully designed by experienced educators. By leveraging these pre-made activities, teachers can confidently engage their students with well-crafted content that aligns with instructional objectives and enhances learning outcomes. This not only simplifies the planning process for instructors but also increases the likelihood that students are actively engaging with materials that have been tested and proven effective in supporting mathematical understanding.

Assignment tracking, reflection, and feedback. Desmos Classroom offers a range of features that provide substantial benefits for both students and teachers in terms of assignment tracking, reflection, and feedback. Students benefit from the platform's programmed instant feedback, which provides prompt responses to most inputs, ensuring immediate awareness of their performance and helping build mathematical confidence. Additionally, Desmos Classroom incorporates social features to encourage collaboration and engagement in open-ended questions, fostering discussion and the exchange of ideas among students. Furthermore, students receive both quantitative and qualitative feedback on their assignments, enabling a comprehensive understanding of their progress and areas for improvement. On the other hand, teachers can leverage Desmos Classroom's tools for efficient assignment management. The check-in screen is ideal for warm-up activities (see pages 1 and 2 of the demo presentation), allowing teachers to gauge student understanding at the beginning of class quickly. The dashboard feature facilitates real-time monitoring of students' progress (see the picture from page 3 of the demo presentation), granting teachers insights into individual and class-wide performance. Lastly, the exit screen serves as a valuable tool for gathering student reflections on their learning experience and addressing any concerns they may have. A practical example of this is showcased on page 13 of the demo presentation, demonstrating how an assignment reflection page can be utilized to record student activity progress and collect their learning feedback. The comprehensive range of features offered by Desmos Classroom equips both students and teachers with the necessary tools to track assignments, foster reflection, and provide meaningful feedback, enhancing the overall learning experience.

Customization Options for Advanced Users. Desmos Classroom provides robust features and functionalities and offers a supportive community for teachers eager to explore its full

potential. Whether teachers prefer to utilize ready-made activities or customize their own, the Desmos community is committed to ensuring every educator's success. For those seeking a higher level of customization, Desmos Classroom offers its own programming language and syntax, which are user-friendly and easily graspable. The online documentation continually undergoes refinement and updates, incorporating new syntaxes and examples to keep pace with evolving needs. Furthermore, teachers can access a vibrant and active community, such as the Facebook group "Desmos Educators" and the Desmos Official Discussion Forum, where they can find invaluable support and resources and engage in fruitful discussions. This community-driven approach fosters collaboration and empowers teachers to leverage the full potential of Desmos Classroom, allowing for innovative and impactful teaching experiences in the mathematics classroom.

In conclusion, Desmos Classroom is an exceptional online platform that enhances mathematical and statistical learning. With its interactive features and user-friendly interface, it allows teachers to create engaging lessons while providing real-time feedback and progress monitoring for students. Desmos Classroom embraces the ever-evolving nature of technology, but its ultimate goal remains the same: to improve the classroom experience for both students and teachers.